

What we claim is:

- 1 1. An optical disc system, comprising:
 - 2 a photo detector circuit of an optical disc drive configured to generate at
 - 3 least one information-carrying signal from an optical disc assembly; and
 - 4 a signal processing system coupled to the photo detector circuit to obtain
 - 5 from said at least one information-carrying signal both operational information
 - 6 used to operate the optical disc system and indicia data indicative of a presence of
 - 7 an investigational feature associated with the optical disc assembly.
- 1 2. The optical disc system of claim 1 wherein the signal processing system
2 includes a PC and analog-to-digital converter coupled between said at least one
3 information carrying signal and the PC.
- 1 3. The optical disc system of claim 2 wherein said analog-to-digital
2 converter provides a digitized signal and said PC includes a first program module
3 to detect and characterize peaks in the digitized signal.
- 1 4. The optical disc system of claim 3 wherein said PC further includes a
2 second program module to detect and count double peaks in the digitized signal.
- 1 5. The optical disc system of claim 2 wherein said signal processing
2 system further includes an analyzer coupled between said analog-to-digital
3 converter and the PC, said analog-to-digital converter provides a digitized signal,
4 and said analyzer includes logic to detect and characterize peaks in the digitized
5 signal.
- 1 6. The optical disc system of claim 5 wherein the analyzer further includes
2 logic to detect and count double peaks in the digitized signal.

1 7. The optical disc system of claim 2 wherein the signal processing system
2 further includes an audio processing module coupled between said at least one
3 information-carrying signal and the analog-to-digital converter.

1 8. The optical disc system of claim 7 further comprising:
2 a predetermined sound recorded on said optical disc assembly; and
3 a program module in said PC for detecting said indicia data in a deviation of
4 said at least one information carrying signal from the predetermined sound when
5 the investigational feature is present.

1 9. The optical disc system of claim 8 wherein the predetermined sound is
2 encoded silence.

1 10. The optical disc system of claim 2 wherein said signal processing
2 system further includes a buffer coupled between said at least one information-
3 carrying signal and said analog-to-digital converter.

1 11. The optical disc system of claim 2 wherein the signal processing
2 system further includes a trigger detection circuit coupled to said analog-to-digital
3 converter, said trigger detection circuit being operative to detect a particular time in
4 relation to a time when said indicia data is present in said at least one information-
5 carrying signal.

1 12. The optical disc system of claim 1 wherein the signal processing
2 system includes a programmable digital signal processor selectively configurable
3 to extract the operational information from said at least one information-carrying
4 signal while in a first configuration and operate as an analog-to-digital converter to
5 provide the indicia data while in a second configuration.

1 13. The optical disc system of claim 1 wherein said signal processing
2 system includes:

3 a PC;
4 a programmable digital signal processor coupled to said at least one
5 information-carrying signal; and
6 an analyzer coupled between said programmable digital signal processor
7 and said PC so that said analyzer provides said indicia data.

1 14. The optical disc system of claim 1 wherein the signal processing
2 system further includes a trigger detection circuit that detects a time period during
3 which the investigational feature associated with the optical disc assembly is
4 scanned by said photo detector circuit.

1 15. The optical disc system of claim 1 wherein said signal processing
2 system further includes a trigger detection circuit that detects a particular trigger
3 time in relation to a respective time duration during which said indicia data is
4 present in said at least one information-carrying signal, and each respective time
5 duration occurs periodically with a respective investigational feature and a
6 corresponding set of indicia data.

1 16. The optical disc system of claim 1 wherein said signal processing
2 system includes a PC and an audio processing module coupled between said PC
3 and said at least one information-carrying signal.

1 17. The optical disc system of claim 16 wherein said audio processing
2 module is one of:
3 an external module independent of the optical disc drive;
4 a drive module that is a part of the optical disc drive; and
5 a modified drive module that is a part of the optical disc drive.

1 18. The optical disc system of claim 16 wherein said PC includes a
2 processor coupled to said audio module, and a software module stored in a
3 memory to control said processor to extract said indicia data from audio data.

1 19. The optical disc system of claim 1 wherein the photo detector circuit
2 includes circuitry to generate an analog signal as said at least one information-
3 carrying signal, said analog signal including one of a high frequency signal from a
4 photo detector, a tracking error signal, a focus error signal, an automatic gain
5 control setting, a push-pull tracking signal, a CD tracking signal, a CDR tracking
6 signal, a focus signal, a differential phase detector signal, a laser power monitor
7 signal, and a sound signal.

1 20. The optical disc system of claim 1 further comprising the optical disc
2 assembly, wherein said optical disc assembly has disposed thereon the
3 associated investigational feature in a first disc sector and has encoded thereon
4 said operational information used to operate said optical disc drive in a remaining
5 disc sector.

1 21. The optical disc system of claim 20 wherein said optical disc assembly
2 comprises a reflective-type optical disc.

1 22. The optical disc system of claim 20 wherein said optical disc assembly
2 comprises a transmissive-type optical disc.

1 23. The optical disc system of claim 20, wherein said optical disc assembly
2 includes a trigger mark disposed thereon in a predetermined position relative to
3 said first disc sector, and said signal processing system further includes a trigger
4 detection circuit that detects said trigger mark.

1 24. The optical disc system of claim 23, wherein said trigger detection
2 circuit detects said trigger mark periodically, and said trigger detection circuit
3 detects said trigger mark at one of (i) a predetermined time in advance of, (ii) a
4 time at, and (iii) a predetermined time after a time when a respective
5 investigational feature is read by said photo detector circuit based on said
6 predetermined position of said trigger mark relative to said first disc sector.

1 25. The optical disc system of claim 1 further comprising one or more
2 additional photo detector circuits configured to generate at least one information-
3 carrying signal from a respective optical disc assembly.

1 26. The optical disc system of claim 20 wherein said optical disc assembly
2 comprises one or more reporters having an affinity for said associated
3 investigational feature.

1 27. The optical disc system of claim 26 wherein said one or more reporters
2 are individually selected from the group consisting of plastic micro-spheres,
3 colloidal gold beads, silica beads, glass beads, latex beads, polystyrene beads,
4 magnetic beads, and fluorescent beads.

1 28. An assay method comprising the steps of:
2 depositing a test sample at a predetermined location on an optical disc
3 assembly;
4 spinning the optical disc assembly in an optical disc drive;
5 directing an incident beam onto the optical disc assembly;
6 detecting a return beam formed as a result of the incident beam interacting
7 with the test sample; and
8 processing the detected return beam to acquire information about an
9 investigational feature associated with the test sample.

1 29. The method of claim 28 wherein said optical disc assembly comprises
2 one or more reporters having an affinity for investigational features in said test
3 sample.

1 30. The method of claim 29 wherein said one or more reporters are
2 individually selected from the group consisting of plastic micro-spheres, colloidal
3 gold beads, silica beads, glass beads, latex beads, polystyrene beads, magnetic
4 beads, and fluorescent beads.

1 31. The method of claim 28 wherein the step of detecting a return beam
2 forms a plurality of analog signals.

1 32. The method of claim 28 further comprising the step of detecting a
2 trigger mark associated with said optical disc assembly.

1 33. An assay method comprising the steps of:
2 depositing a test sample at a predetermined location on an optical disc
3 assembly;
4 spinning the optical disc assembly in an optical disc drive;
5 directing an incident beam onto the optical disc assembly;
6 detecting a transmitted beam formed as a result of the incident beam
7 interacting with the test sample and continuing through said disc assembly; and
8 processing the detected transmitted beam to acquire information about an
9 investigational feature associated with the test sample.

1 34. The method of claim 33 further comprising the steps of detecting a
2 reflected beam formed as a result of the incident beam interacting with the test
3 sample, and processing the detected reflected beam to acquire information about
4 an investigational feature associated with the test sample.

1 35. The method of claim 33 wherein said optical disc assembly comprises
2 one or more reporters having an affinity for investigational features in said test
3 sample.

1 36. The method of claim 35 wherein said one or more reporters are
2 individually selected from the group consisting of plastic micro-spheres, colloidal
3 gold beads, silica beads, glass beads, latex beads, polystyrene beads, magnetic
4 beads, and fluorescent beads.

1 37. The method of claim 33 wherein the step of detecting a transmitted
2 beam forms a plurality of analog signals.

1 38. The method of claim 33 further comprising the step of detecting a
2 trigger mark associated with said optical disc assembly.

1 39. A method comprising steps of:
2 acquiring a plurality of analog signals from an optical disc assembly using
3 one or more photo detectors;
4 summing a first subset of the plurality of analog signals to produce a sum
5 signal;
6 combining a second subset of the plurality of analog signals to produce a
7 tracking error signal;
8 obtaining information used to operate an optical disc drive from the tracking
9 error signal; and
10 converting the sum signal to a digitized signal.

1 40. The method of claim 39 wherein the steps of acquiring and summing
2 produce the sum signal, and the sum signal includes perturbations indicative of an
3 investigational feature positioned at a location of the optical disc assembly.

1 41. The method of claim 39 further comprising a step of characterizing the
2 investigational feature based on the digitized signal.

1 42. The method of claim 39 wherein the step of converting includes
2 configuring a portion of an optical disc drive chip set to operate as an analog-to-
3 digital converter.

1 43. The method of claim 42 wherein the step of configuring comprises
2 programming a digital signal processing chip within said optical disc drive chip set
3 to operate as an analog-to-digital converter.

1 44. The method of claim 43 wherein said digital signal processing chip
2 includes a normalization function, an analog-to-digital converter function, a
3 demodulation/decode function, and an output interface function.

1 45. The method of claim 44 wherein said step of configuring further
2 comprises by-passing said sum signal around said demodulation/decode function
3 by creating a path from said analog-to-digital converter function to said output
4 interface function.

1 46. The method of claim 45 wherein said step of configuring further
2 comprises deactivating said demodulation/decode function.

1 47. The method of claim 39, wherein said step of converting includes
2 configuring a digital signal processing chip that includes a normalization function,
3 an analog-to-digital converter function, a demodulation/decode function, and an
4 output interface function; and said step of configuring comprises creating a path
5 from said analog-to-digital converter function to said output interface function so
6 that said sum signal is unprocessed by said demodulation/decode function.

1 48. The method of claim 47 wherein said step of configuring comprises
2 deactivating said demodulation/decode function.

1 49. The method of claim 39 wherein said step of acquiring includes tapping
2 one or more of said plurality of analog signals directly at said one or more photo
3 detectors, and said step of converting includes directing said signals into an
4 analog-to-digital converter.

1 50. The method of claim 49 wherein said step of converting further includes
2 directing said analog signals from said one or more photo detectors into a buffer
3 amplifier before processing by said analog-to-digital converter.

1 51. The method of claim 39 wherein said step of acquiring includes tapping
2 one or more of said plurality of analog signals after processing by an optical disc
3 drive chip set and said step of converting includes directing said signals into an
4 analog-to-digital converter.

1 52. The method of claim 51 wherein said step of converting further includes
2 directing said analog signals from said optical disc drive chip set into a buffer
3 amplifier before directing said analog signals into said analog-to-digital converter.

1 53. A method comprising the steps of:
2 adapting a portion of a signal processing system to operate as an analog-
3 to-digital converter;
4 acquiring a plurality of analog signals from a photo detector circuit of an
5 optical disc drive, the plurality of analog signals including information therein that is
6 indicative of investigational features on an optical disc assembly;
7 converting said analog signals into a digitized signal with said signal
8 processing system; and
9 characterizing said investigational features based on said digitized signal.

1 54. The method of claim 53 wherein said step of adapting comprises
2 programming a digital signal processing chip within said signal processing system
3 to operate as the analog-to-digital converter.

1 55. A method comprising the steps of:
2 receiving each of at least one analog signal at a corresponding input of
3 signal processing circuitry, said at least one analog signal having been provided
4 by at least one corresponding photo detector element that detects light returned
5 from a surface of an optical disc assembly; and
6 converting each of said at least one analog signal into a corresponding
7 digitized signal, each digitized signal being substantially proportional to an

8 intensity of said returned light detected by a corresponding one of said at least one
9 photo detector element.

1 56. The method of claim 55 wherein said step of converting includes
2 operating the signal processing circuitry to bypass any demodulation of a first
3 digitized signal.

1 57. The method of claim 56 wherein said step of converting further
2 includes:

3 operating the signal processing circuitry to bypass any decoding of the first
4 digitized signal; and

5 operating the signal processing circuitry to bypass any checking for errors
6 in the first digitized signal.

1 58. The method of claim 55 wherein said step of converting includes
2 operating the signal processing circuitry to bypass any decoding of a first digitized
3 signal.

1 59. The method of claim 55 wherein said step of converting includes
2 operating the signal processing circuitry to bypass any checking for errors in a first
3 digitized signal.

1 60. The method of claim 55 further comprising a step of combining at least
2 two of said at least one analog signal.

1 61. The method of claim 60 wherein said step of combining is a step
2 selected from a group consisting of adding, subtracting, dividing, and multiplying,
3 and any combination thereof.

1 62. The method of claim 61 wherein said step of combining is performed
2 before said step of converting.

1 63. The method of claim 61 wherein said step of combining is performed
2 after said step of converting.

1 64. The method of claim 55 wherein said step of receiving includes at least
2 one analog signal provided by at least one corresponding photo detector element
3 that detects light transmitted through an optical disc assembly.

1 65. The method of claim 55 wherein said step of receiving includes
2 detection of a trigger mark indicative of a time period during which the
3 investigational feature associated with the optical disc assembly is scanned by
4 said at least one photo detector.

1 66. The method of claim 55 further comprising a step of supplying a first
2 digitized signal of said at least one digitized signal at an output interface of the
3 signal processing circuitry after said step of converting without substantially
4 modifying said first digitized signal between said steps of converting and
5 supplying.

1 67. The method of claim 66 wherein said signal processing circuitry
2 comprises a digital signal processor.

1 68. The method of claim 66 wherein said signal processing circuitry
2 comprises an external analog-to-digital converter.

1 69. The method of claim 68 wherein said signal processing circuitry further
2 comprises a buffer amplifier before said external analog-to-digital converter.

1 70. A signal characteristic of information about an investigational feature
2 located in an optical disc assembly, said signal generated by a process comprising
3 the steps of:

4 depositing a test sample at a predetermined location on an optical disc
5 assembly;
6 spinning the optical disc assembly in an optical disc drive;
7 directing an incident beam onto the optical disc assembly;
8 detecting a return beam formed as a result of the incident beam interacting
9 with the test sample; and
10 processing the detected return beam to acquire information about an
11 investigational feature associated with the test sample.

1 71. The signal generated by the process of claim 70 wherein said return
2 beam is formed as a result of the incident beam interacting with one or more
3 reporters having an affinity for investigational features in said test sample.

1 72. The signal generated by the process of claim 70 wherein the step of
2 detecting a return beam forms a plurality of analog signals.

1 73. The signal generated by the process of claim 72 wherein the step of
2 processing the detected return beam includes:

3 summing a first subset of the plurality of analog signals to produce a sum
4 signal;
5 combining one of the first subset and a second subset of the plurality of
6 analog signals to produce a tracking error signal;
7 obtaining information used to operate an optical disc drive from the tracking
8 error signal; and
9 converting the sum signal to a digitized signal.

1 74. The signal generated by the process of claim 73 wherein the sum
2 signal includes perturbations indicative of an investigational feature located at a
3 location of the optical disc assembly.

1 75. The signal generated by the process of claim 73 wherein the step of
2 converting includes configuring a portion of an optical disc drive chip set to operate
3 as an analog-to-digital converter.

1 76. The signal generated by the process of claim 75 wherein the step of
2 configuring comprises programming a digital signal processing chip within said
3 optical disc drive chip set to operate as an analog-to-digital converter.

1 77. The signal generated by the process of claim 76 wherein said digital
2 signal processing chip includes a normalization function, an analog-to-digital
3 converter function, a demodulation/decode function, and an output interface
4 function.

1 78. The signal generated by the process of claim 77 wherein said step of
2 configuring further comprises passing said sum signal around said
3 demodulation/decode function by creating a path from said analog-to-digital
4 converter function to said output interface function.

1 79. The signal generated by the process of claim 78 wherein said step of
2 configuring further comprises deactivating said demodulation/decode function.

1 80. The signal generated by the process of claim 73 wherein said step of
2 converting includes directing said sum signal into an external analog-to-digital
3 converter.

1 81. The signal generated by the process of claim 80 wherein said step of
2 converting further includes directing said sum signal into a buffer amplifier prior to
3 said external analog-to-digital converter.

1 82. The signal generated by the process of claim 73, wherein said step of
2 converting includes configuring a digital signal processing chip that includes a

3 normalization function, an analog-to-digital converter function, a
4 demodulation/decode function, and an output interface function; and said step of
5 configuring comprises creating a path from said analog-to-digital converter
6 function to said output interface function so that said sum signal is unprocessed by
7 said demodulation/decode function.

1 83. The signal generated by the process of claim 70 wherein said step of
2 detecting further comprises detecting a transmitted beam formed as a result of the
3 incident beam interacting with the test sample and passing through said optical
4 disc assembly.

1 84. The signal generated by the process of claim 70 wherein the step of
2 detecting a return beam forms a plurality of analog signals and the step of
3 processing the detected return beam includes:

4 summing a first subset of the plurality of analog signals to produce a sum
5 signal;

6 combining a second subset of the plurality of analog signals to produce a
7 tracking error signal;

8 obtaining information used to operate an optical disc drive from the tracking
9 error signal; and

10 converting the sum signal to a digitized signal.

1 85. The signal generated by the process of claim 84 wherein the sum
2 signal includes perturbations indicative of an investigational feature located at a
3 location of the optical disc assembly.

1 86. The signal generated by the process of claim 84 wherein the step of
2 converting includes configuring a portion of an optical disc drive chip set to
3 operate as an analog-to-digital converter.

1 87. The signal generated by the process of claim 86 wherein the step of
2 configuring comprises programming a digital signal processing chip within said
3 optical disc drive chip set to operate as an analog-to-digital converter.

1 88. The signal generated by the process of claim 87 wherein said digital
2 signal processing chip includes a normalization function, an analog-to-digital
3 converter function, a demodulation/decode function, and an output interface
4 function.

1 89. The signal generated by the process of claim 88 wherein said step of
2 configuring further comprises passing said sum signal around said
3 demodulation/decode function by creating a path from said analog-to-digital
4 converter function to said output interface function.

1 90. The signal generated by the process of claim 89 wherein said step of
2 configuring further comprises deactivating said demodulation/decode function.

1 91. The signal generated by the process of claim 84, wherein:
2 said step of converting includes configuring a digital signal processing chip
3 that includes a normalization function, an analog-to-digital converter function, a
4 demodulation/decode function, and an output interface function; and
5 said step of configuring comprises creating a path from said analog-to-
6 digital converter function to said output interface function so that said sum signal is
7 unprocessed by said demodulation/decode function.

1 92. A signal generated by a process comprising the steps of:
2 adapting a portion of a signal processing system to operate as an analog-
3 to-digital converter;
4 acquiring a plurality of analog signals from a photo detector circuit of an
5 optical disc drive, wherein the plurality of analog signals includes information
6 therein that is indicative of investigational features on an optical disc assembly;

7 converting said analog signals into a digitized signal with said signal
8 processing system; and
9 characterizing said investigational features based on said digitized signal.

1 93. The signal generated by the process of claim 92 wherein said step of
2 adapting comprises programming a digital signal processing chip within said signal
3 processing system to operate as the analog-to-digital converter.

1 94. The signal generated by the process of claim 92 wherein said step of
2 acquiring includes tapping said analog signals prior to an optical drive buffer.

1 95. The signal generated by the process of claim 92 wherein said step of
2 acquiring includes trigger mark signals indicative of a time period during which the
3 investigational feature associated with the optical disc assembly is scanned by the
4 photo detector circuit.

1 96. A method of detecting a signal within an optical disc system comprising
2 the steps of:

3 generating an incident beam of known wavelength;
4 directing said beam onto an optical disc containing an investigational
5 feature; and
6 receiving a return beam formed as a result of the incident beam interacting
7 with the investigational feature.

1 97. The method of claim 96 wherein said optical disc comprises one or
2 more reporters having an affinity for said investigational feature, said reporters
3 being capable of interacting with said incident beam.

1 98. The method of claim 97 wherein said one or more reporters are
2 individually selected from the group consisting of plastic micro-spheres, colloidal

3 gold beads, silica beads, glass beads, latex beads, polystyrene beads, magnetic
4 beads, and fluorescent beads.

1 99. The method of claim 96 wherein said step of receiving further
2 comprises receiving a transmitted beam formed as a result of the incident beam
3 interacting with the investigational feature, and passing through said optical disc.

1 100. The method of claim 96 wherein said step of receiving involves use of
2 one or more photo detectors.

1 101. The method of claim 100 wherein said step of receiving forms a
2 plurality of analog signals for processing by a signal processing system.

1 102. The method of claim 101 wherein said signal processing system
2 comprises an external analog-to-digital converter.

1 103. The method of claim 102 wherein said signal processing system
2 further comprises a buffer amplifier.

1 104. The method of claim 103 wherein said analog signals are tapped prior
2 to processing by an internal optical disc drive buffer circuit.

1 105. The method of claim 101 wherein said signal processing system
2 comprises programmable digital signal processing circuitry.

1 106. The method of claim 101 wherein said signal processing system
2 comprises audio processing circuitry.

1 107. A method of imaging an investigational feature comprising the steps
2 of:
3 depositing an investigational feature at a predetermined location on an
4 optical disc assembly;

5 spinning the optical disc assembly in an optical disc drive;
6 directing an incident beam onto the optical disc assembly;
7 detecting a return beam formed as a result of the incident beam interacting
8 with the investigational feature;
9 processing the detected return beam to acquire information about an
10 investigational feature; and
11 imaging said investigational feature based on said information.

1 108. The method of claim 107 wherein said optical disc assembly
2 comprises one or more reporters having an affinity for investigational features in
3 said test sample.

1 109. The method of claim 108 wherein said one or more reporters are
2 individually selected from the group consisting of plastic micro-spheres, colloidal
3 gold beads, silica beads, glass beads, latex beads, polystyrene beads, magnetic
4 beads, and fluorescent beads.

1 110. The method of claim 107 wherein the step of detecting a return beam
2 forms a plurality of analog signals, and said step of processing comprises
3 converting said analog signals into a digitized signal.

1 111. The method of claim 110 wherein said step of processing involves a
2 signal processing system.

1 112. The method of claim 111 wherein said signal processing system
2 comprises an external analog-to-digital converter.

1 113. The method of claim 112 wherein said signal processing system
2 further comprises a buffer amplifier.

1 114. The method of claim 111 wherein said signal processing system
2 comprises programmable digital signal processing circuitry.

1 115. The method of claim 111 wherein said signal processing system
2 comprises audio processing circuitry.

1 116. The method of claim 110 wherein the step of processing the detected
2 return beam includes:

3 summing a first subset of the plurality of analog signals to produce a sum
4 signal;

5 combining one of the first subset and a second subset of the plurality of
6 analog signals to produce a tracking error signal;

7 obtaining information used to operate an optical disc drive from the tracking
8 error signal;

9 converting the sum signal to a digitized signal; and
10 outputting said digitized signal.

1 117. The method of claim 116 wherein the step of outputting involves
2 displaying the digitized signal on a monitor.

1 118. The method of claim 116 wherein the step of outputting involves
2 playing the digitized signal as sound using speakers.

1 119. A kit for the detection of an investigational feature in a test sample,
2 the kit comprising carrier means being compartmentalized to receive one or more
3 optical discs.

1 120. The kit of claim 119 further comprising one or more containers, said
2 containers comprising one or more agents selected from the group consisting of
3 isolated nucleic acids, antibodies, proteins, reagents, and reporters.

- 1 121. The kit of claim 119 further comprising an optical bio-disc.
- 1 122. The kit of claim 119 further comprising a setup optical disc.
- 1 123. The kit of claim 119 further comprising a buffer amplifier card, said
2 card being adapted to retrofit into an optical disc drive.
- 1 124. The kit of claim 119 further comprising a modified optical disc drive.
- 1 125. An optical analysis disc for detection of a signal element, comprising:
2 a substrate layer;
3 an operational layer associated with said substrate layer, said operational
4 layer having operational information encoded therein; and
5 a signal element positioned relative to said operational layer, said signal
6 element and said operational layer having optical or magnetic characteristics
7 selected to provide a predetermined contrast therebetween to thereby provide a
8 return signal indicative of distinctions between information associated with said
9 operation layer and characteristics of said signal element.
- 1 126. The optical analysis disc according to claim 125 wherein said optical
2 or magnetic characteristics include electrical or magnetic polarization state of said
3 signal element and said operational layer.
- 1 127. The optical analysis disc according to claim 125 wherein said optical
2 or magnetic characteristics include irradiance of said signal element and said
3 operational layer.
- 1 128. An optical analysis disc for use in imaging a biological or medical
2 investigational feature, comprising:
3 a substrate;

4 an operational layer associated with said substrate, said operational layer
5 having encoded operational features positioned relative to each other at a
6 specified track pitch; and

7 an investigational feature positioned relative to said operational layer, said
8 investigational feature selected to be larger in size than a corresponding
9 operational feature and at least as large in size as one-half of said track pitch to
10 thereby provide at least one scan of said investigational feature as an incident
11 beam tracks along said operational features.

1 129. The optical analysis disc according to claim 128 wherein rotational
2 speed of the disc is controlled to produce a higher quantized resolution in the
3 digitization of a return signal generated by the disc.

1 130. The disc according to claim 128 including logic to provide random
2 access to preaddressed locations on the disc.

1 131. The disc according to claim 129 including logic to provide random
2 access to preaddressed locations on the disc.

1 132. The method of claim 31 wherein said step of processing the detected
2 return beam includes:

3 summing a first subset of the plurality of analog signals to produce a sum
4 signal;

5 combining one of the first subset and a second subset of the plurality of
6 analog signals to produce a tracking error signal;

7 obtaining information used to operate an optical disc drive from the tracking
8 error signal; and

9 converting the sum signal to a digitized signal.

1 133. The method of claim 37 wherein said step of processing the
2 transmitted beam includes:

- 3 summing a first subset of the plurality of analog signals to produce a sum
- 4 signal;
- 5 combining one of the first subset and a second subset of the plurality of
- 6 analog signals to produce a tracking error signal;
- 7 obtaining information used to operate an optical disc drive from the tracking
- 8 error signal; and
- 9 converting the sum signal to a digitized signal.